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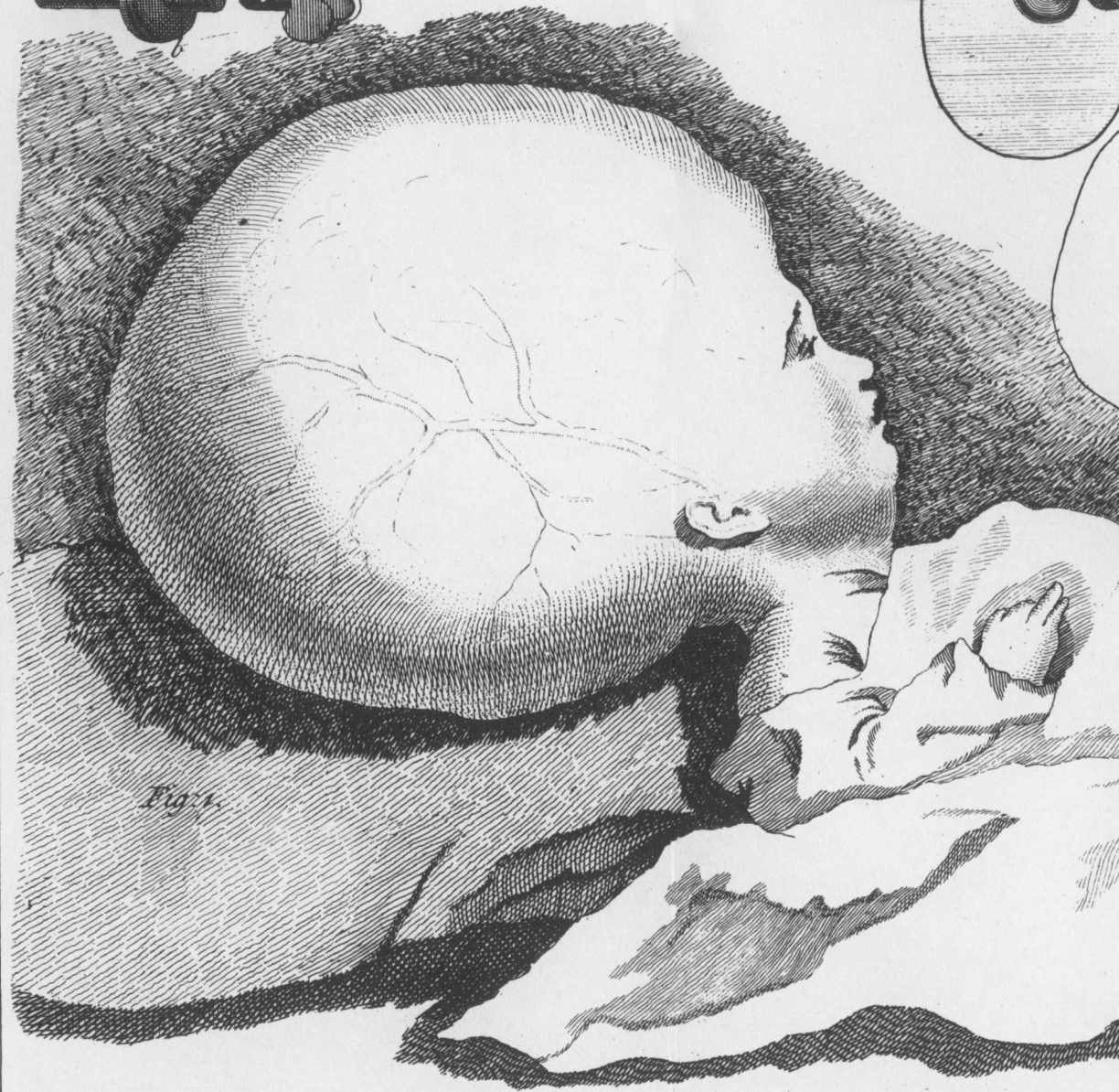
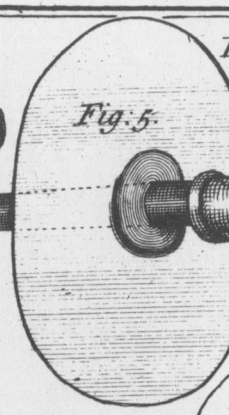
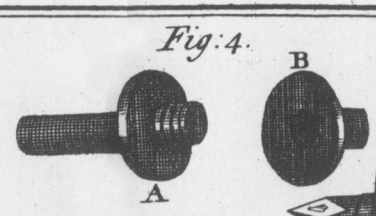
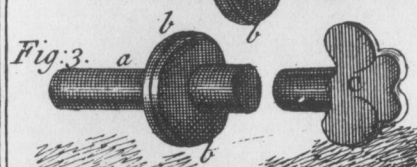
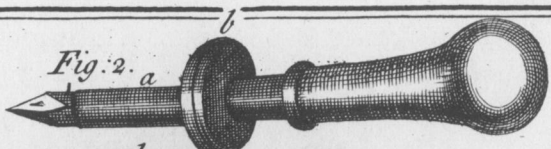
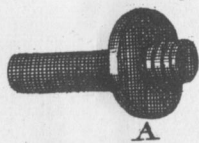


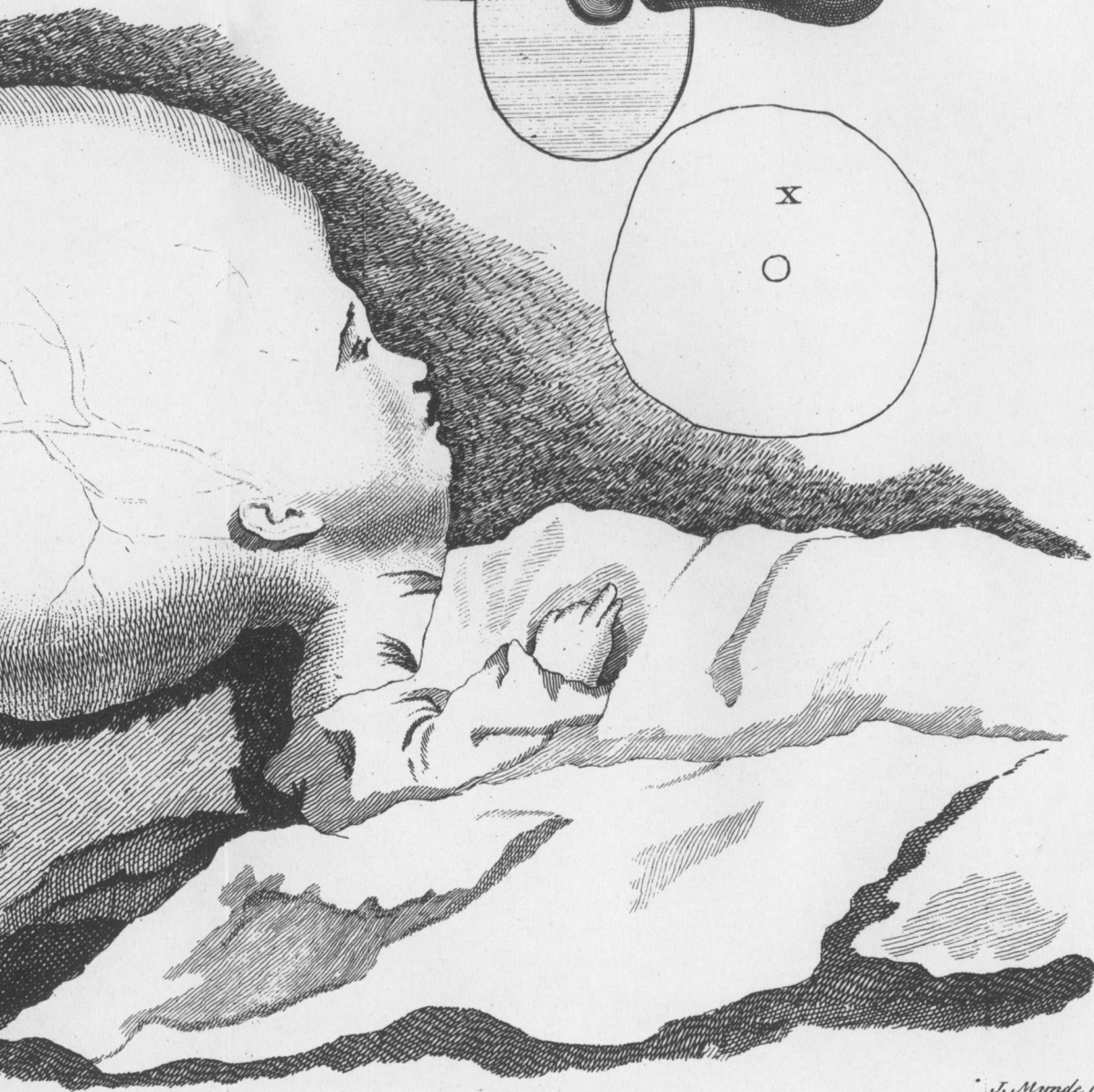
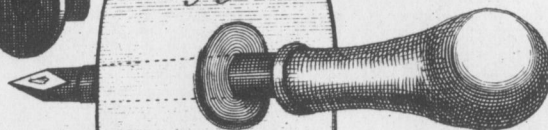
Fig: 4.



B



Fig: 5.



XL. *A new Trocart for the Puncture in the Hydrocephalus, and for other Evacuations, which are necessary to be made at different Times ; by M. le Cat, F. R. S. Translated from the French by Tho. Stack, M. D. F. R. S.*

Read Oct. 31.

1751.

ON the 15 of October, 1744, Peter Michel, an infant of three months and a half old, son of a weaver, of the suburb of St. Sever of Rouen, was brought to me, having his head, for five weeks past only, as big as it appears in Fig. 1. All the sutures of the scull were considerably separated, asunder; the exterior veins of the head very much swoln, and the eyes turned downward. This infant was pretty plump, and had had no distemper before this accident; but from the time it appear'd, he became very froward, far from being dull or lethargic, as some authors say.

A hydrocephalus of so enormous a size, and so speedily formed, appear'd to me incurable by medicines in so young an infant; and entertaining no greater hopes from the operation, I exhorted the parents to patience. They came again to me, and earnestly intreated me, saying, that their child could not possibly hold out long against a distemper, which gain'd ground so very fast. They took the event on themselves, and by force of intreaties made me resolve on the operation.

I suspected, that the cause of the deaths (and sudden too for the most part) of those, who had been

punctured for the hydrocephalus, might probably be, that all the water had been drawn off at once ; and that the brain had been left, as it were, uncover'd, and expos'd to the impressions of the air, which must necessarily fill the wide space, that had been occupied by the water ; since, in this case, the integuments could not be press'd close on the contained parts, as it happens to the integuments of the *abdomen* after the puncture in the *ascites*. Wherefore, since I was prevail'd on to make the puncture, I resolv'd to draw the water by little and little, at different times distant from each other ; and in the intervals of these evacuations to compress the integuments with a proper bandage, to make them come near the brain.

The common trocars did not seem proper to fulfil these views. I was of opinion, that punctures often repeated in these nervous parts were dangerous : besides, as the integuments of the head were thin, and upon the stretch, the opening being once made would never close sufficiently to stop the evacuation, when the *canula* was removed ; and if I left the *canula* in the orifice, and stopp'd it with a stopple, this same disposition of the integuments would suffer the water to ouze out between them and the sides of the *canula* : thus would the evacuation become total, in spite of me, whatever method I us'd with the trocars already known. These reflections made me contrive the following instrument.

It is a new trocar, represented by Fig. 2. and which has this peculiarity, that the *canula* is much shorter than ordinary. This *canula* is represented separate in Fig. 3. : but there ought to be several,  
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of different lengths for different cases. On the upper part of this *canula* there are two circles, each one of which is fasten'd to a different piece. These pieces are exhibited separate in Fig. 4. and they are made so as to be screw'd one on the other. These circles are somewhat concave in their surfaces, which correspond reciprocally; so that their circumferences touch, while there is a tolerable vacuity towards their centre. By means of this simple mechanism, I apply the plaster  $\kappa$ , with a hole in it, on the lower circle *A*, whose screw passes into the hole of the plaster: this done, I screw the upper piece *B* on the lower *A*, and I squeeze the plaster tight between these two circles. The instrument becomes then as in Fig. 5. The plaster, which I have chosen, is that of Andreas a Cruce; but one may use Burgundy-pitch, or any other powerful emplastick, at pleasure. My plaster was three inches broad. To the upper end of the *canula* I adapted a very exact silver stopple *c*, Fig. 3. The part, where I intended to make the puncture, was shaved, wider than the plaster.

Thus having prepared every thing, and the *canula* being armed with its trocart, and fortified with the plaster, as it appears Fig. 5. I performed the puncture on Friday the 23 of October 1744, by thrusting in the trocart and *canula* up to the circles and plaster, which I applied and made to stick in all its parts on the head, by pressing it with my hand and fingers made very warm, and also with hot linen-cloths. When the plaster was thoroughly well fasten'd on, I pull'd out the trocart, and drew four or five ounces of serosity, of a brownish white, or  
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the colour of pale white-wine, and somewhat foul: after which I closed the *canula* with its stopple *c*.

By chemical experiments, this liquor was found to be neither acid nor alkaline: being put on the fire, it evaporated quite away, and left at bottom a frothy neutro-saline sediment.

Saturday, Oct. 24, I unstopp'd the *canula*, and drew the same quantity of water. The infant was ill on the Sunday: wherefore I did not disturb him that day. Monday the 26 he was better. I drew five more ounces of water. Tuesday I suffer'd him to take rest. Every time that I made this evacuation, I bound the head with a strong capeline \*. Notwithstanding these precautions, the infant died in the night between Tuesday and Wednesday; and it will presently appear, that this hydrocephalus was of an incurable sort. I open'd it, and found the brain applied against the *dura mater* as usual; but this brain was thin, and as it were spread out: it only formed a kind of thin sack fill'd with water. I open'd, and saw that the disease was nothing more than an excessive dilatation of the two lateral ventricles, by the waters collected therein. The *glandula pinealis* was almost wasted, as well as the *plexus choroides*, of which some few vestiges only remain'd. On the contrary, the other vessels, which lined the inside of this sack, were very visible.

As the brain is a soft *viscus* without elasticity. it manifestly appears, that it could not possibly resume its natural form, how slowly soever I had evacuated the

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\* A bandage peculiar to the head.

the waters: but perhaps the operation would have succeeded, if the seat of the dropfy had been on the outside of the brain. However that be, this trocart to me seems useful for several operations: and this is my first motive for presenting it to the Royal Society. My second motive for so doing is, the consequences, which may be deduced from this observation with regard to the apoplexy.

How can one believe, that the apoplexy is caused by the extravasation of the liquids, or by the fullness of the vessels, after having seen a brain filled with water, and distended so vastly as this was, without any one apoplectic symptom? Verduc, who in his pathology proposes an objection similar to this against his own system, endeavours to solve it, but has not succeeded. The objection remains victorious.

Nevertheless, when the brain of a person dead of an apoplexy is open'd, and extravasated blood is found in it, his death is imputed to this extravasation alone, and the apoplexy is pronounced sanguineous. This has happened on the death of M. De Frequienne, president of our parliament. On opening him I found about a tea-spoon full of blood extravasated within the *medulla oblongata*, between the third and fourth ventricle, at the beginning of the latter. Could so small a quantity of blood press on the principles of the nerves so as totally to intercept the course of the spirits? No, certainly; for this would be mistaking the effect for the cause. This extravasated blood was but an accident owing to the convulsive motions of the *dura mater*, and of the vessels of the whole basis of the scull, seized with the apoplectic disorder, which most commonly is  
nothing



nothing else but the matter of the gout or rheumatism fixing on this source of the nerves. Now this general attack, which swells and distends the *dura mater* throughout this whole basis, makes the blood stagnate in the vessels, some of the weakest of which burst, and at the same time closes all the canals of the nerves, and consequently kills the patient. Unless a person would chuse to say, that those broken canals were those, which concurred in the substance of the brain to the formation of the spirits, that give motion to the heart: which opinion is not free from difficulties; since it is well known, that this organ receives the influences of several nerves at a time, all which ought to bear their part in this accident, which, after all, is but the rupture of a simple capillary vessel.

The drift of these reflections is to engage practitioners to have somewhat less confidence in their theories, and, for example, not to make a poor apoplectic patient die under the lancet; a thing, which I have seen several times, from the notion which they hold, that it is the over-great quantity of blood, that kills: for, besides that this false opinion is fatal to this patient in particular, it will still be so to all future apoplectics, if the prejudice in favour of this theory be such as to prevent seeking the true causes, and the real remedies of the apoplexy.